

WHAT IS CLAIMED IS:

1. A fluid mixing unit for mixing diagnostic or medical fluids along biomedical lines, comprising: a body that is internally hollow and is provided with at least one pair of intake ports for introducing two fluids to be mixed, said intake ports being connectable to respective feeder devices,  
5 and with a discharge port for discharging a mixture of the two fluids, said discharge port being connectable to an outflow device; and a duct shaped so as to enable flow and mixing of the two fluids, said duct being formed in said body and being connected to said intake ports and to said discharge  
10 port.

2. The unit of claim 1, wherein said body comprises an opening for exit of gases contained or generated inside the unit, said opening being associated with said duct.

3. The unit of claim 2, further comprising gas venting means that are  
15 associated with said gas exit opening.

4. The unit of claim 1, wherein at least one portion of said duct is substantially shaped as a spiral or helix.

5. The unit of claim 2, wherein said duct comprises at least two consecutive portions that are connected to each other and are arranged so as  
20 to be crossed by mutually opposite flows, a first one of said portions being associated with said intake ports, and a second one being associated with said discharge port.

6. The unit of claim 5, comprising a connector for said two portions and said gas exit opening.

25 7. The unit of claim 5, wherein an inner one of said portions is formed inside a volume delimited by the other, outer portion.

8. The unit of claim 5, wherein each one of said two portions has an end thereof that is adjacent and connected to an end of the other portion.

9. The unit of claim 5, wherein said body is substantially cylindrical,  
30 said mixture discharge port and said gas exit opening being formed,

respectively, proximate to opposite ends of the body and said intake ports being formed proximate to said mixture discharge port.

10        10. The unit of claim 5, comprising a first substantially cylindrical element, which is inserted substantially coaxially inside said body and is provided with a contoured outer lateral surface, said outer portion being  
5        formed by an inner lateral surface of said body and by an outer lateral surface of said first substantially cylindrical element.

11. The unit of claim 10, wherein said outer lateral surface of the first substantially cylindrical element is shaped as a spiral or a helix.

10        12. The unit of claim 11, wherein said outer lateral surface of the first substantially cylindrical element is formed by intersection of two threads, shaped as a helix or as a spiral, that have mutually opposite winding  
directions.

15        13. The unit of claim 10, comprising a second substantially cylindrical element, which is inserted substantially coaxially in a respective seat formed in said first substantially cylindrical element and is provided with a contoured outer lateral surface, said inner portion being formed by a  
wall of said seat and by an outer lateral surface of said second substantially cylindrical element.

20        14. The unit of claim 13, wherein said outer lateral surface of the second substantially cylindrical element is shaped as a spiral or as a helix.

15. The unit of claim 7, wherein one of said two portions is provided for ascending flow and the other one for descending flow.

25        16. The unit of claim 15, wherein said outer portion is associated with said intake ports and is provided for ascending flow, the inner portion being associated with said discharge port and being provided for descending flow.

17. The unit of claim 3, wherein said venting means comprises a floater valve.

18. The unit of claim 17, wherein said valve is normally open.

30        19. The unit of claim 2, comprising filtering means that are associated

for fluid filtering with said gas exit opening.

20. The unit of claim 19, wherein said filtering means are of a hydrophobic type.

21. The unit of claim 6, wherein said connector comprises a partition  
5 having passages for connecting adjacent ends of said two portions and said gas exit opening.

22. The unit of claim 7, comprising at least one impeller inserted along said duct for the flow and mixing of the two fluids.

23. The unit of claim 22, wherein said impeller is constituted by a  
10 shaft with a set of vanes wrapped therearound, said set of vanes being shaped substantially like a helix.

24. The unit of claim 22, wherein said impeller is inserted in said duct substantially coaxially to said body, said outer portion being formed by an outer lateral surface of the impeller and by an inner lateral surface of said  
15 body.

25. The unit of claim 24, wherein said inner portion is formed by a channel arranged inside said shaft.

26. The unit of claim 24, wherein said inner portion is formed by a tube around which at least two said outer portions are distributed radially,  
20 each one of said outer portions being associated with a respective said intake port.

27. The unit of claim 1, wherein feeder devices are provided that comprise each a three-way valve, in which two ways are provided for flow control with a respective unidirectional flow control element, and are each  
25 respectively associated with a fluid reservoir and with one of said intake ports, a third way being provided pervious and associable with a control injector.

28. The unit of claim 27, wherein said three-way valve comprises an internal chamber that is connected to the ways thereof.

30 29. The unit of claim 27, wherein said unidirectional flow control

elements are opposite to each other, the way associable with the reservoir being provided for inflow of fluid into the three-way valve and the way associable with the intake port being provided for outflow of fluid from the three-way valve.